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American and British Grey-iron Casting Selling Prices

The Gray Iron Founders' Society, of the United States, has issued a booklet in conjunction with the Office of Price Administration in Washington, dealing with the regulation of the prices of grey-iron castings during the war. The regulations themselves are given in full, and are accompanied by explanatory notes given in the form of question and answer.

The maximum allowance price which the seller is allowed to charge is the highest price at which he sold the casting of the same design, or offered it for sale, between August 1, 1941, and February 1, 1942, that is the period immediately before and immediately after the entry of the United States into the war. Where a casting to be priced is not identical, the allowable price is that at which the seller sold, or offered for sale, a similar casting during the above-mentioned period. In both cases provision is made for additional charges in respect of overtime labour.

When castings cannot be priced in accordance with the foregoing principles, then provision is made for pricing according to a standardised pricing method. This pricing method is based on that which was in use at the foundry on February 1, 1942, and the method must have been lodged with the Office of Price Administration. Using this as a basis, the various items making up the price, such as labour rates, materials, overhead expenses, overtime, profit, etc., are calculated in accordance with detailed instructions given in the regulations. Provision is made for adjustments in exceptional circumstances and in cases of hardship, and exemption from the regulation is given in respect of small orders. The system is commendably thorough and detailed, and it is difficult to imagine any factors which have been overlooked.

Price regulation of iron castings in this country during the war has been carried out much more simply. Until June, 1940, the maximum price which a seller was allowed to charge was the highest price which he had charged for the same casting previous to September, 1939. Small percentage increases were allowed from time to time to cover the increased cost of materials and manufacturing operations. This regulation did not apply to castings which were new to any given foundry, and there was no control over the price of such castings. In June, 1940, price control of grey-iron castings was entirely removed, except for rainwater pipes and gutters and soil pipes, the prices for which continue to be regulated by schedule. Considerable increases in the prices in this schedule have been granted from time to time since that date.

The elaborate system instituted in the United States will probably encourage the founder to pay greater attention to the make-up of his prices, and should go a long way towards the realisation of that ideal of the grey-iron founder, standard costing. On the other hand, during the period of wartime stress and shortage of staffs, the carrying out of these regulations must have added much to the clerical work of the ironfounder. Ironfounders in this country are fortunate in that elaborate regulations for pricing have not been added to the many other rules and regulations which they have to obey, and the lack of detailed control does not seem to have resulted in general in any excessive charges for iron castings or in profiteering. Of course, the imposition of 100 per cent. excess profits tax has a profound influence on price stabilisatior

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WE LEARN THAT Mr. A. A. B. Menzies, a member of the Institute of British Foundrymen, escaped from Singapore just before the Japanese invasion. He went to Australia and he has now settled down in Adelaide.

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FORTHCOMING EVENTS

FEBRUARY 23.

Institution of Mechanical Engineers:—Open Discussion: "Let's Talk of Troubles." At Storey's Gate, St. James's Park, London, S.W.1, at 5.30 p.m.

FEBRUARY 24.

Institution of Mechanical Engineers:—Meeting of Graduates' Section. "The Problems Involved in the Establishment of a Large Works in a Country District," by N. Hanlon, G.I.Mech.E. At Storey's Gate, St. James's Park, London, S.W.1, at 3.30 p.m.

FEBRUARY 27.

Sheffield Metallurgical Association:—"Safety Pins and Swords," by Lord Halsbury. At the Sheffield Metallurgical Club, 198, West Street, Sheffield, 1, at 6.30 p.m.

MARCH 7.

Institution of Chemical Engineers:—Joint area meeting with the South Yorkshire Section of the Royal Institute of Chemistry. Visit to Nitrogen Fertilisers, Limited, Flixborough, in morning. Luncheon at the Blue Bell Hotel, Scunthorpe. "The Future Aspects of Research for Industry," by Dr. E. W. Smith, President of the Institute of Fuel.

MARCH 8.

Institute of Metals (London Local Section):—Discussion on "Metals in Housing," to be opened by G. H. Friese-Greene. At 4, Grosvenor Gardens, London, S.W.1.

MARCH 10.

Keighley Association of Engineers:—Annual dinner, at 5.30 p.m., at which the guest of honour will be Sir Miles Thomas, D.F.C., vice-chairman of the Nuffield organisation.

Institute of British Foundrymen

FEBRUARY 24.

Birmingham Branch:—"Costs in a Jobbing Foundry," by H. E. E. Holladay, B.Sc. At the James Watt Institute, Great Charles Street, Birmingham, at 2.30 p.m.

East Midlands Branch:—"Some Thoughts on Foundry Management," by J. Roxburgh. At Loughborough College, at 6 p.m.

FEBRUARY 26.

Sheffield Branch:—"The Study of Liquid Metal Temperature and Solidification Range as a Foundry Control by Means of a Thermocouple," by R. C. Tucker, M.A. At the Royal Victoria Hotel, Sheffield, at 7 p.m.

FEBRUARY 28.

London Branch:—"Inoculated Irons," by A. E. McRae Smith, M.A. At the Charing Cross Hotel, London, W.C.2, at 7.30 p.m.

MARCH 3.

Bristol and West of England Branch:—"Plaster and Plastic Patternmaking and Low Melting Point Metals," by H. Plucknett. At the Imperial Hotel, Exeter, at 3 p.m.

THE FINANCIAL STATEMENT for the year ending September 30, 1944, of the Canadian Car & Foundry Company, Limited, shows the net profit available for dividends is $1,130,306, compared with $832,241 for the previous year. Common stock earned $1.52, compared with 68 cents in 1943. The President, Mr. Victor M. Drury, reports favourable prospects for capacity operations during 1945 in both car equipment and aircraft divisions. Orders for railway equipment on the books, the great majority for export, will continue to keep the car and steel foundry plants fully employed to the end of 1945.

BOOK REVIEW

Plastics and Industrial Design. By John Gloag. Published by George Allen & Unwin, Limited, Ruskin House, 40, Museum Street, London, W.C.1. Price 10s. 6d.

The reviewer has never been particularly enthusiastic about plastics, but he is *épris* with Mr. Gloag's new book. Herein, the Author, who is an ardent advocate of modern industrial design, gives by excellent illustration and letterpress a brilliant exposition as to how an infinite variety of plastics can be made to serve mankind in its endeavour to surround itself with artistic yet serviceable goods. The Author dedicates his book to the true inventor of plastics, Alexander Parkis, of Birmingham, who was born in 1813 and lived until 1890. It was he who gave the world the xylonite combs, knife handles, and the like. It is clearly shown that plastics have their own particular sphere, and its protagonists would do well to bear that in mind, for by stressing the value of plastics as replacement materials, they tend to show a lack of inventiveness.

There is an illustration on page 42 of an "Aga" cooker, but from the text it is not very clear just how much of the clear cut design uses plastics and how much is cast iron. The advocates of plastics will no doubt bring into relief how important a place they have occupied in fields of armaments. Herein it seems desirable to point out that the peacetime manufacture of munitions of war is very different from emergency conditions, as the important factor of depreciation upon long storage arises. Plastics are so new that the effect of the time element is still "x."

It is interesting to learn from this book that, so far, no means have been found, when plastics are cast to shape, to carry out a process analogous to coreing up. This should cheer up the light alloy founder! Finally, the reviewer strongly recommends his readers to buy this book, not just on account of the subject matter, but because it is at this time most desirable for business people to focus their attention on industrial design, and whatever Mr. Gloag writes on this subject is worth studying.

V. C. F.

IN THE LIST of newly-elected members of the Institute of British Foundrymen, published in our last issue, the name of Mr. F. Hoult, of Lincoln, was inadvertently included among the associate members instead of in the list of full members.

A 12-PAGE BOOKLET, "Reclamation of Iron Castings," issued by the Suffolk Iron Foundry (1920), Limited, of Sifbronze Works, Stowmarket, gives very practical instructions on the repair of cylinder heads, blocks and valve seats, using the oxy-acetylene fusion welding process. Very rightly the care necessary in the preheating of the parts is stressed. Here possibly the burying of the repaired component in Kieselguhr might usefully have been included. The diagram on page 9 should be specially useful to operatives. The pamphlet, No. 3239A, is available to those readers who send a 1d. stamp to Stowmarket.

SOME OBSERVATIONS ON THE STRUCTURE OF ACID-RESISTANT VITREOUS ENAMELS FOR CHEMICAL PLANT

High-frequency spark test and the detection of voids in enamelled coatings

By G. E. CHARLISH, B.Sc., F.R.I.C. and E. J. HEELEY, Assoc. Met. (Sheff.)

(*Continued from page* 130.)

Examination of Enamel Coatings by Metallographical Methods

In order to obtain some information concerning the nature of the enamel coatings, sections were cut and prepared for microscopic examination. Difficulties were experienced at first in the preparation of sections suitable for microscopical examination because of the brittleness of the enamel coating, but, after a series of experiments with abrasive discs, a technique of cutting the enamel without involving mechanical damage was evolved. The subsequent stages of preparation are carried out in a similar manner to those involved in the preparation of metallic specimens. Particular care is necessary to avoid any appreciable heating of the enamel, as this results in the loss of enamel due to flaking.

The microscopical examinations revealed that the outstanding feature of all vitreous enamels was the presence of numerous voids, generally spherical in shape and of various sizes. These occur in enamel coatings on both cast iron and mild steel, whether applied by the hot dusting or the wet spraying processes. Representative examples of the structure of commercial acid-resisting enamels supplied for use in chemical plant are illustrated at a magnification of 75 diameters in Figs. 6, 7, 8 and 9. Considerable variation may occur in the distribution and size of the voids from one region to another of the same enamel coating and between enamels of different manufacture. The enamels illustrated in Figs. 6, 7 and 8 had been applied by the hot dusting process to cast iron and represent three different sources of supply. A similar wide range of distribution of voids also occurs in acid-resistant enamels applied to mild steel, Fig. 9

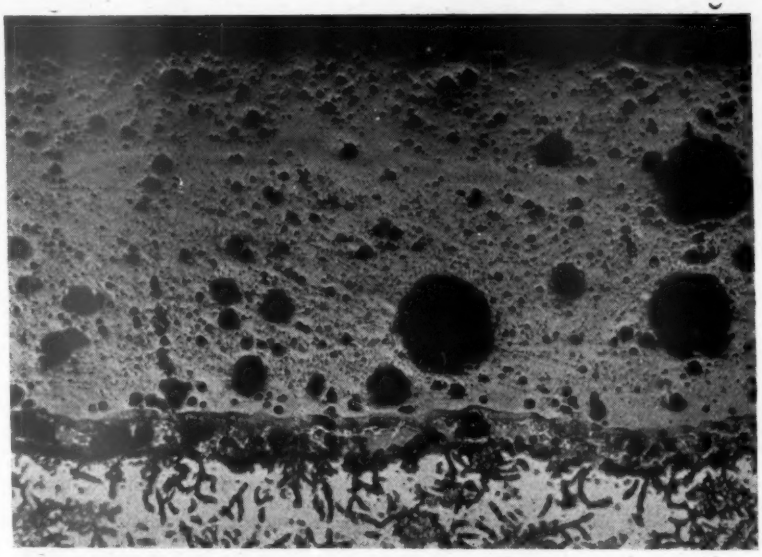


FIG. 6.—"HOT DUST" ENAMEL ON CAST IRON. × 75.

being a representative example. In general it is not possible to make a distinction as regards structure between "hot dust" and "wet spray" enamel.

Examinations have been made of specimens cut at random from plant items which had been discarded from service owing to premature failure, although it was evident that little, if any, direct evidence of the condition of the enamel at the point of origin of the failure could be drawn from examples such as those illustrated previously in Figs. 2 and 3, because of the inevitable total loss of the material, both metal and for the premature failure of the enamelled plant item concerned.

The presence in the enamel of local weaknesses of the character illustrated in Fig. 10 was not suspected, particularly in view of the careful inspection to which enamelled plant items are subjected on completion of the manufacturing process.

Commercial Methods of Testing the Continuity of Enamelled Surfaces

The inspection procedure applied to enamelled plant items supplied to the chemical industry ordinarily consisted of visual examination of the enamelled surfaces, together with some form of electrical test to

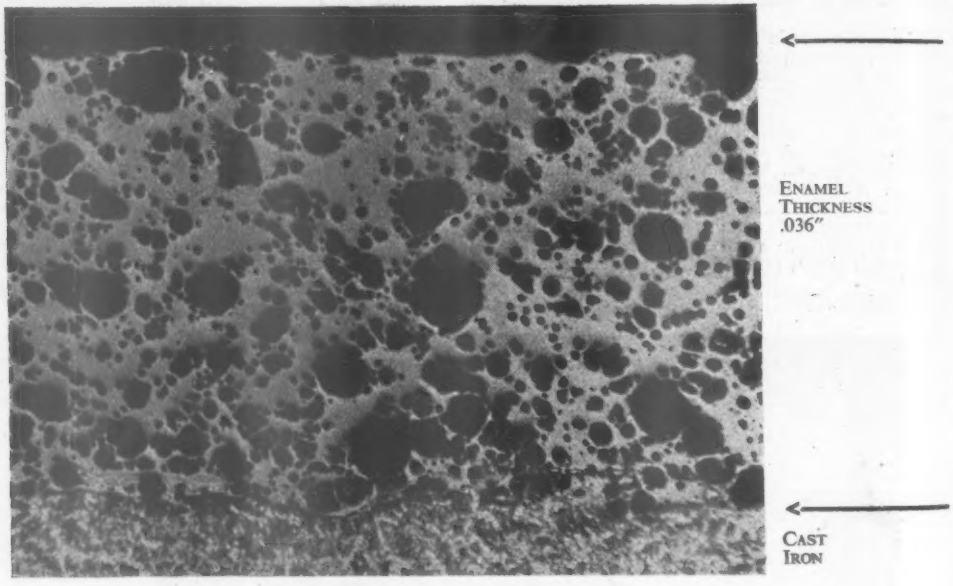


FIG. 7.—"HOT DUST" ENAMEL ON CAST IRON. × 75.

enamel, at the point at which access of the corrosive medium to the basis metal first became effective. The presence of occasional relatively large voids in the enamel on defective plant items had, however, been observed in several instances, a typical example being illustrated in Fig. 10. It will be observed that the void indicated by the arrow occupied a large proportion of the thickness of the enamel coating at this position, and was evidently a local weakness in the enamel on account of the possibility of ready breakdown of the thin film between the void and the outer surface of the enamel. Failure of the thin enamel film would provide a path for access of corrosive media to the basis metal, and could thus be responsible

determine the continuity of the enamel coating. In the "wet" tests advantage is taken of the insulating properties of the enamel, a continuous film of enamel preventing passage of current from a liquid in contact with the enamel to the basis metal. The usual tests involve the application of a conductive liquid, such as brine to the enamel coating, and the detection of the flow of current which passes when a voltage is applied between the electrolyte and the metal portion of the plant item. The electrolyte, usually brine, is applied to the surface of the plant item either by means of a swab or by employing sufficient liquid completely to cover the surface under examination.

Various methods for revealing the presence of in-

completely enamelled metal, by detection of the flow of current are used, including:—(*a*) A milliameter; (*b*) a lamp of low wattage ("Glow" test); (*c*) a "megger" type of instrument ("Megger" test), and (*d*) a chemical indicator such as phenol phthalein.

The purchase of enamelled plant for the chemical industry being conditional upon freedom from defects in the enamel coating when tested by one or more of the above methods, it was not unnaturally assumed that the enamel coatings would be continuous, i.e.,

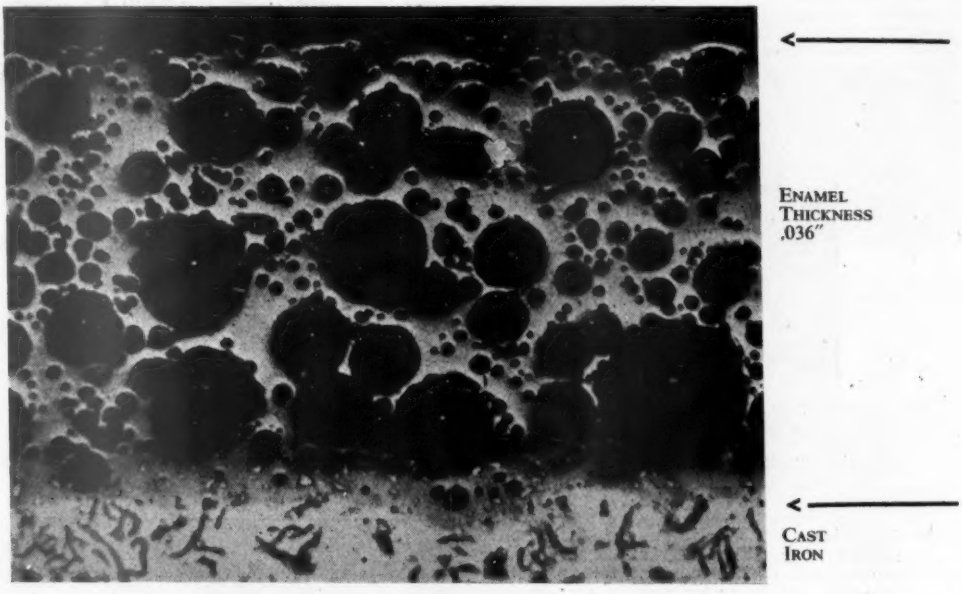


FIG. 8.—"HOT DUST" ENAMEL ON CAST IRON. × 75.

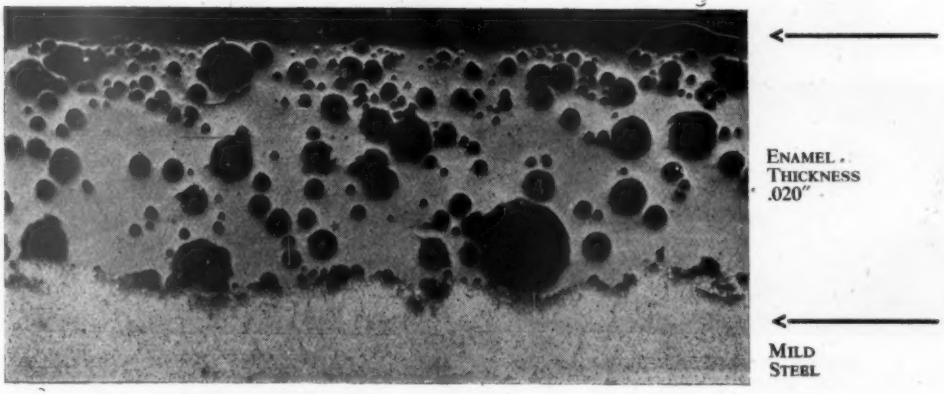


FIG. 9.—"WET SPRAY" ENAMEL ON MILD STEEL. × 75.

Acid-resistant Vitreous Enamels

free from discontinuities which would permit the access of corrosive media to the basis metal. Experience has, however, shown that these "wet" tests are not to be relied upon to detect certain types of flaws in enamel coatings, and that premature failure of enamelled plant items occurred despite the test results indicating flawless coatings.

Another form of electrical test, almost identical with that employed to detect flaws in the rubber linings applied to chemical plant, is, however, available. In this method the passage of a high-frequency spark is employed to indicate the presence of regions of relatively imperfect insulation, and the test is readily applied to quite large surfaces. It has the particular advantage of not requiring the application of an electrolyte to the surfaces under examination. In carrying out the high-frequency spark test an insulated electrode is moved over the enamel, the nature of the electrical discharge being observed visually. A purple surface discharge indicates an enamel coating free from discontinuities, whilst a characteristic white spark which passes between the electrode and the discontinuity shows the presence of a fault in the enamel.

The method of applying the electrode to the enamelled surface under test is indicated in Figs. 11 and 12, the former illustrating a standard type of reaction vessel cover, and the latter a typical enamelled cast-iron reaction vessel. The high voltage discharge employed in carrying out the high-frequency spark test is obtained by using a small Tesla coil, with no return lead (see circuit diagram given in Fig. 13), and thus the energy available at the spark is very small. Samples of enamel have been subjected to the discharge for lengthy periods in order to ascertain if any breakdown of the coating occurred due to the application of the test. No sign of damage has been observed.

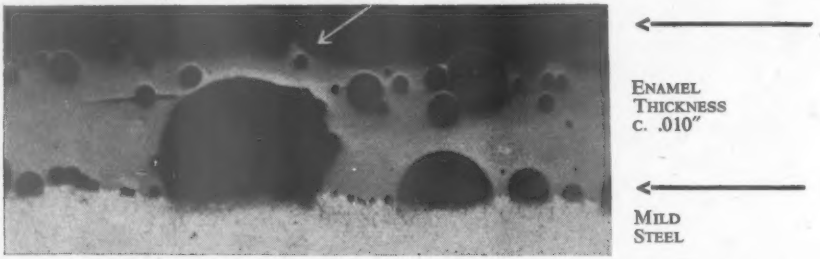


FIG. 10.—CROSS SECTION THROUGH ENAMEL COATING OF DEFECTIVE PLANT ITEM. (MILD STEEL). × 75.

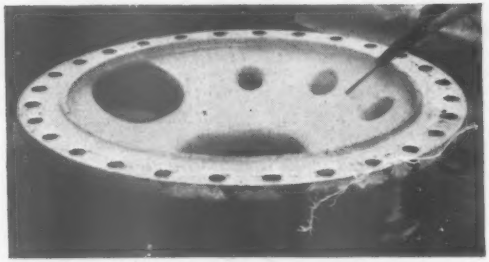


FIG. 11.—APPLICATION OF HIGH-FREQUENCY SPARK TEST TO AN ENAMELLED CAST-IRON COVER OF A REACTION VESSEL (100-GALL. SIZE).

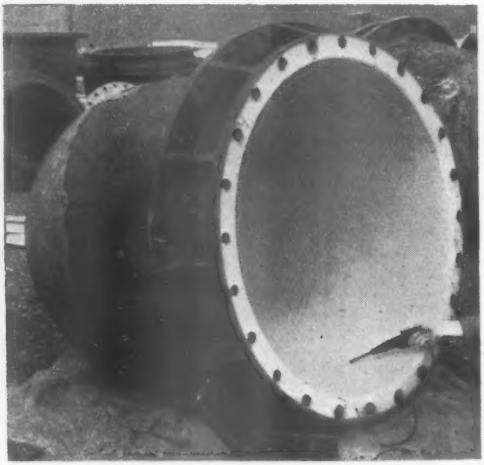


FIG. 12.—APPLICATION OF HIGH-FREQUENCY SPARK TEST TO AN ENAMELLED CAST-IRON REACTION VESSEL (250-GALL. SIZE).

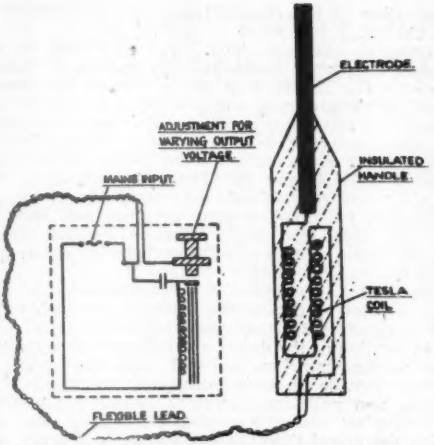


FIG. 13.—CIRCUIT DIAGRAM OF HIGH-FREQUENCY SPARK TEST OUTFIT.

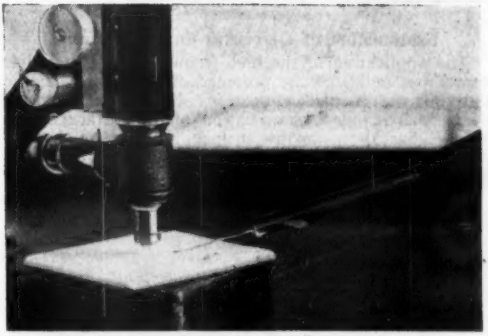


FIG. 14.—APPLICATION OF HIGH-FREQUENCY SPARK TEST TO ENAMEL SURFACE UNDER MICROSCOPE. (THIN WIRE ELECTRODE EMPLOYED).

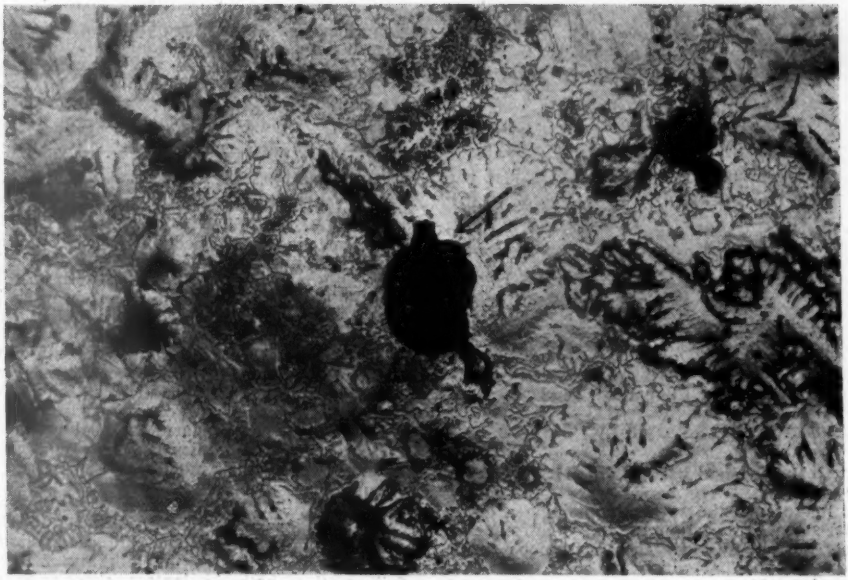


FIG. 15.—SURFACE OF CHEMICALLY ACID-RESISTANT ENAMEL. THE DARK AREA INDICATED BY THE ARROW WAS REVEALED AS A DEFECT BY THE HIGH-FREQUENCY SPARK TEST. (SIZE OF DEFECT .007″ × .009″). × 75.

Acid-resistant Vitreous Enamels

Examination of Defects in Enamel Coatings

The application of the high-frequency spark test has sometimes indicated the presence of apparently minute flaws in the enamel, almost invisible to the unaided eye. Microscopical examination of the surface of the enamel has shown many surface hollows or shallow "pits," but it was not possible to distinguish by visual examination between the depressions in the surface

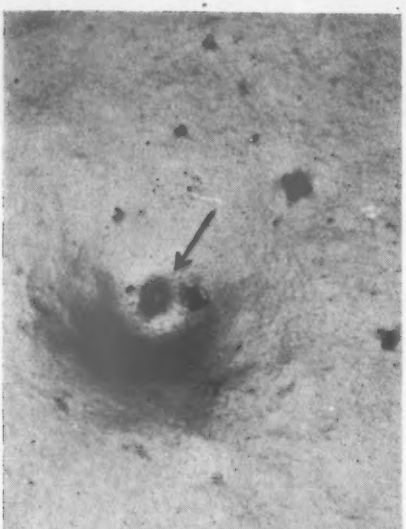


FIG. 16.—SURFACE OF DOMESTIC ACID-RESISTANT ENAMEL. THE SMALL DARK AREA INDICATED BY THE ARROW WAS REVEALED AS A DEFECT BY THE HIGH-FREQUENCY SPARK TEST. (DIAMETER OF DEFECT c. .003"). ×75.

and the defect which had been revealed by the high-frequency spark test. The experiment of examining under the microscope the surface containing a defect during the actual application of the high-frequency spark test was next tried, the microscope being focussed on the point at which the spark penetrated the enamel. Fig. 14 shows a portion of enamel under the combined microscopical and high-frequency examinations. By this means positive identification of the exact position at which the high-frequency spark had indicated a flaw was effected, thus leading to the determination of the characteristics of actual defects in the enamel.

Numerous samples have been examined by the method referred to above and the position of defects located. The condition of the surface of the enamel does not usually give any positive indication of the presence of underlying defects. The appearance under the miscroscope of enamel surfaces varies considerably, as may be noted from the two examples illustrated in Figs. 15 and 16. The surface shown in Fig. 15 is that of an acid-resistant enamel on mild steel as supplied for chemical plant purposes, and includes the relatively large defect indicated by the arrow. Fig. 16 shows a defect in the surface of a domestic "acid-resistant" enamel.

The procedure adopted in the investigation of the characteristics of the minute defects revealed by the high-frequency spark test was as follows:—

The position of the defect was indicated by scratches made on the enamel surface with a diamond point in order to provide an easily seen guide during the preparation and polishing operation. After the removal from the plant item of a specimen of suitable size containing the actual defect, a cut was made through the enamel at a little distance from the centre of the defect by means of a thin abrasive wheel employed with water cooling. Further cuts were made in the enamel coating in order to obtain a specimen of suitable size for examination and the basis metal sawn—generally from the back—to the required dimensions. At this stage it has generally been found convenient to embed the specimen in one of the thermosetting plastics to facilitate the preparation for microscopical examination.

(To be continued.)

NOTES FROM THE BRANCHES

FALKIRK SECTION.—Another interesting and successful meeting of the Section was held at Falkirk on February 9, under the chairmanship of Mr. T. R. Goodwin, of Bonnybridge. In spite of extremely trying weather, a fair number of members heard a lucid description of a plant specially installed for "The Reclamation of Aluminium Alloys in an Aero-engine Factory." The speaker on this occasion was Mr. A. H. Rathbone, of Rolls-Royce, Limited, who was accompanied by Mr. John Vickers, foundry superintendent. The reclamation of such scrap as swarf, borings, gates and contaminated material was thoroughly explained and the efficient handling and fluxing methods received their modicum of attention. Indeed, the quality of the Paper, and its treatment by the Author, left little to be desired in explanation, but several questions were subsequently put to Mr. Rathbone, and answered to the full satisfaction of the audience. A feature of the talk lay in the wealth of illustration, both in lantern slides and samples, which brough' .o the listeners the atmosphere of the plant, and a good conception of the faith held by the speaker and his foundry superintendent in this secondary metal.

SOME PATTERNMAKING CONSIDERATIONS

Patternshops must be astride the times

By R. L. SIMPSON

Only the fringe of the do's and dont's of this extensive craft can be dealt with, as so much depends on the accuracy of the individual, and not in a collective sense as with a multiple machine part, which in the course of manufacture may be inspected many times. The points brought forward in praise of the patternmaker craftsman would no doubt create some little stir in the minds of foundrymen. Patterns in the main are looked upon as an expensive non-productive item, but the art has not yet reached the stage when they may be eliminated.

During the past few years the Author's pattern department has produced patterns numbering over five figures, and amongst these quite a considerable number has been used by outside foundries. The number of queries as to methods of construction for satisfactory moulding to fit in with individual foundries has been very few. It will, therefore, be appreciated why it is essential for a patternshop to be astride the times.

Timber

Generally speaking, two types of wood stand out as the most suitable for patternmaking—yellow pine and mahogany.

Yellow Pine.—This is a soft, straight grained, even textured wood with inconspicuous growth ring. The timber works very easily by hand and machine tools, and has little dulling effect on their cutting edge. It finishes excellently in most operations, cutting well both with and across the grain, provided the cutters are reasonably sharp. It has good nailing, screwing and glueing properties; it is readily treated with preservatives, and has a low shrinkage ratio.

African Mahogany.—The timber works fairly easily with hand and machine tools, but varies somewhat in working qualities. The milder grades are about 10 per cent. and the denser grades often more than 50 per cent. harder to cut than Honduras mahogany. The dulling effect on tools is relatively small. It has good nailing, screwing and glueing properties, and responds well to the usual finishing treatment.

Pattern Construction

During the past few years there has been a tendency to side track the all important point of laying out a reasonably intricate job. In taking this step as a first operation, the patternmaker not only impresses in his mind's eye the main features, but also obtains an added picture of his ultimate aim. Again, as so many drawings are to scale, the foundryman can get a better idea of the metal thicknesses he will encounter. Pattern equipment plays an important part in determining the cost of castings. Whether or not the foundryman manufactures the pattern, his suggestions as to its construction should be given serious consideration. Judgment as to the expense which may be incurred is based upon an appreciation of the length of time a pattern may be expected to produce castings of dimensional accuracy.

There are many variations in pattern construction of which the patternmaker may take advantage. Some of these, whilst lowering pattern costs, impose unnecessary expense in producing the casting. Parts may be attached, as loose pieces which more properly should be made by the use of a core, thus obviating in many cases a part down or drawback. The construction of a pattern should be given much thought and be planned as the result of experience and observation. It is not enough that a casting can be produced from a pattern; it must be constructed with proper consideration of its maximum utility.

Patterns carved from the solid timber are relatively cheap, but should be used only for a limited production, such as master patterns or urgent jobs where only one is required. It has been proved more

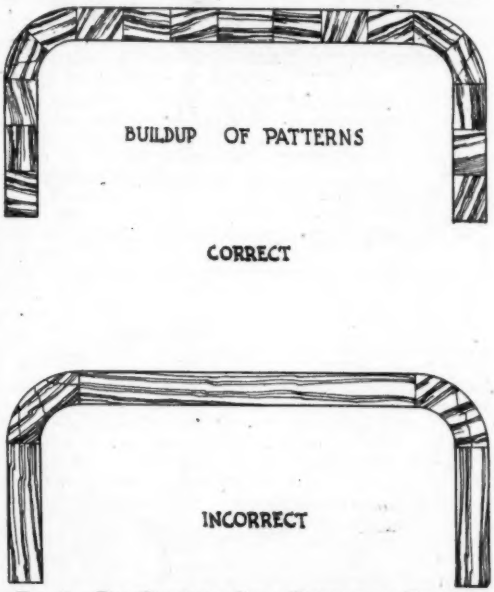


FIG. 1.—THE GLUED-UP STRIP PROCESS OF PATTERNMAKING.

* Paper read before the West Riding of Yorkshire Branch of the Institute of British Foundrymen.

Some Patternmaking Considerations

satisfactory (excluding metal patterns) in standard work to use the glued-up strip process. This is shown in Fig. 1. By this method the timber's grain is confined, thus dispensing with its tendency to warp and dry-in, when in contact with heat or moisture.

As all cast metals exhibit some shrinkage in changing from the molten state to the solid, some contraction in cooling takes place, it is therefore obvious that the casting will not be the same size as the pattern and, due to mould resistance (and various other causes), will not always be the same shape as the pattern. The phrase "true to pattern" is a misnomer. To produce castings "true to drawing" it is necessary to make the pattern of such dimensions and shape as to compensate for the natural shrinkage of the metal, the effects of mould resistance, etc.

The allowance to be made on the pattern to produce the casting of proper size and shape, depends partly on casting design, mould design, shrinkage and contraction characteristics of the metal involved, and many other factors. These factors cannot be computed mathematically (*i.e.*, contraction per inch), and, although contraction rules are used to given standards, a process of trial and error must be undertaken so that pattern dimensions can be adjusted to give castings of dimensions required by drawings. These points are mentioned to emphasise once again that close collaboration between the designer, patternmaker and the foundryman is essential.

One of the main points with which a patternmaker has to deal is the best way to overcome the variations in the results. For example, the construction of a core box used for oil sand compared with the common

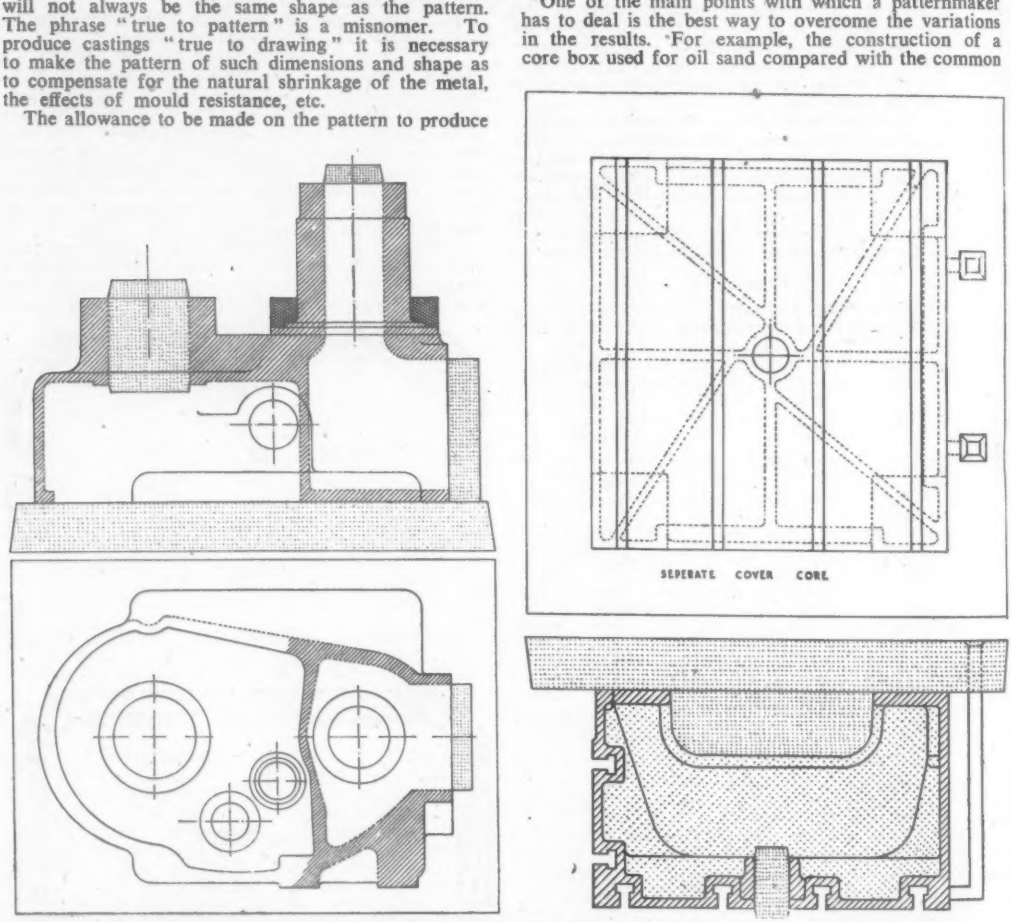


FIG. 2.—SKETCHES SHOWING THE CONSTRUCTION OF A BLOCK PATTERN EMBODYING A COVER CORE.

core sand can be cited. It has been found in practice that considerable distortion takes place when the former is used, due no doubt to its composition. To obviate this trouble the following precautions may be taken:—(1) Collapsible boxes; (2) loose metal pieces which remain in cores during drying time; (3) metal boxes, and (4) liberal taper where possible.

Classes of Patterns

In general, patterns may be classified as follows:—(1) Large and medium floor work; (2) single loose wood or metal patterns; (3) runnered wood or metal patterns; (4) metal match plates; (5) wood boards with tops and bottoms, and (6) metal plates with tops and bottoms.

Single loose wood patterns are relatively cheap, but should be used only for a limited production. Such patterns are warped easily by moisture and are damaged readily in handling. Certain types of jobs even though ordered in small quantities will yield a more satisfactory casting, and at a lower cost if a plaster pattern on plate is made. Runnered wood patterns may be used for small quantity production, but this type of equipment is often open to the same general criticism as single loose wood patterns in regard to warpage and breakage.

It has been found in actual practice that the making of a plaster plate, for even a small quantity, more than halved the cost and produced a better casting. From receipt of the pattern by the matrix maker to the placing in production, covers a period of about 8 hrs. Metal match plate patterns for large quantities of small castings for rapid and accurate reproduction involves a greater initial expenditure, but the increased outlay of money is compensated amply by other savings when the cost of patterns is spread over a large quantity production.

The matrix or metal patternmaker plays an important part in the general scheme of an up-to-date patternshop and foundry, especially when the latter is equipped with moulding machines. His duties comprise the following:—(*a*) Plaster plates and blocks; (*b*) duplication of patterns in white metal, brass, aluminium or cast iron, and (*c*) reproduction from master patterns for either loose metal pattern or plates.

The matrix or metal patternmaker, being familiar with moulding, adds the necessary skill as to the type of runner necessary to produce a sound casting. The most common metal used for metal patterns is cast iron, but it has its disadvantages unless care be taken to see that a fairly high-silicon and phosphoric iron is used to obtain a sharp casting. Brass is more expensive, but is easily worked with an added advantage in that one is able to build up if necessary with solder. Aluminium being of a light nature makes a satisfactory plate pattern. It can be easily worked and soon brought into production.

Production

In a modern engineering concern, the question of production enters largely into the type of pattern required. In preference to the old method of skeleton patterns, a block pattern would be made for jolting with either a cover core or flat top joint. An example of this is shown in Fig. 2. On first thought, it may be assumed that making a block pattern will tend to overload the foundry with cores, but, as already pointed out, every endeavour is made in the design to cut out superfluous undercuts. Further, the great saving in moulding time far outweighs the addition of core making time.

During the past 20 years woodworking-machine makers have concentrated on improving the efficiency and cutting power of their products. This is showing beneficial results from an output point of view. Additional aids to quick production may be added, *i.e.*, leather fillet and plastic wood in preference to putty and beeswax.

From these notes it will be realised that careful consideration of all points mentioned are essential if patterns of dimensional accuracy and stability are to be produced, as it is upon these latter two points that castings to drawings are made possible.

DISCUSSION

MR. J. SMITH said the draughtsman nearly always left the drawing square and, personal contact apart, it was sometimes difficult to find out which were the essential dimensions. If draughtsmen would clearly mark the dimensions on the drawing and inform the patternmaker as to the important dimensions, it would help. There seemed to be a wide variation in the way of making core prints, and there ought to be some standard under which all core prints should conform instead of having so many sizes. It was surprising the diversity of core prints entering the patternshop showing no taper on the drawing.

MR. SIMPSON, replying, said he fully agreed with the suggestions mentioned, and in his own works they made a definite point of having taper shown on the drawing, whilst the design was submitted to the patternmaker before it was produced.

The PRESIDENT (Mr. L. Turner) said the patternmaker had a thankless task, but he could not understand why there was not more room or clearance in preparing for the core.

MR. SIMPSON pointed out that the patternmaker would work accurately to the drawing, but if the moisture content of the moulding is incorrect sagging could be anticipated. The patternmaker made measurements on the assumption that materials would fit the job.

MR. J. BLAKISTON said there was a certain amount of creeping in metal. On the pattern there were sagging, joint lift, weight lift and core expansion. The only way was to check the cores up to a jig, and if that was done the matter of error, if the measure was correct, was not too apparent.

MR. J. TIMBRELL said Mr. Simpson had referred to plaster pattern plates, and he would ask what was the thickness of these, and did he prefer them to other materials?

MR. SIMPSON replied that in his own case they had the outside frame V'd, double-sided, and the plaster was run into them. They used ordinary plaster or

Some Patternmaking Considerations

cominstone—they had both—and it was moulded just as a moulder would make a casting. For machine moulding he would make it two-sided and for floor moulding a single plate.

In answer to an enquiry as to whether he could give any formula for plaster in the 8-hr. period mentioned, MR. SIMPSON said they made it at, say, 4 p.m. for use the following morning.

The member pointed out that in his case it took at least a couple of days, but the need for quick drying could be overcome by adding coke breeze. A good finish required a day or two.

MR. SIMPSON said he was referring to a small production job. For a large work he would allow time to let it set more thoroughly.

Standard Pattern Colours

MR. A. S. WORCESTER asked whether in Mr. Simpson's case he worked to standard pattern colourings.

MR. SIMPSON recollected that some years ago he received a set of patterns from Germany, and they were the same colours as he now used. He understood American practice was to use black for the pattern part and red for the prints. He believed what he used was pretty general. The machine surfaces to be machined were coloured yellow.

MR. SMITH confessed he did not know whether there was supposed to be a standard in the United Kingdom, but it would be simple for the storekeeper if all colours were uniform. Some use the American black pattern and red core prints and yellow store pieces, but some others seemed to have the reverse order.

MR. BLAKISTON said there was a British Standards Specification drawn up for pattern colours, to which every firm in the country was supposed to work.

In answer to Mr. Worcester, MR. SIMPSON said he had found it useful to put preservative into the pattern wood before varnishing. Sand-papering and varnishing gave a glossy face which would last a long time.

MR. WORCESTER said he had found a very fine surface was produced with creosote preservative, then a couple of coats of paint and two varnishes, but even then they could not always stop the sand from adhering to it.

MR. SIMPSON said these conditions arose when the sand was steamy, for if it was warm it had a tendency to adhere to the pattern.

MR. WORCESTER said that the patternmaker who made patterns to a price and to a drawing had no interest in the foundry side of the job or he would never deliver much of the equipment he was sending out. He pointed out that some of the foundry instructions were so complicated that he would be a clever patternmaker who could follow them. There was no standard in foundry requirements in patternmaking as there should be.

(*Continued at foot of next column.*)

NICKEL DEPOSITS ON CAST IRON

The method recommended by the Armament Research Department of the Ministry of Supply for depositing nickel on cast iron involves anodic etching, under conditions defined below, in fairly concentrated sulphuric-acid solution, the preparatory treatments being as follow:—

(1) Remove excess of grease, dirt, etc.; wires; (2) stop-off with wax; fix special anode if necessary; (3) clean electrolytically in alkaline solution; rinse; and (4) (*a*) *anodically etch in sulphuric-acid solution.* Solution:—Sulphuric acid, Sp. gr. 1.84 to 60 (by weight); water, Sp. gr. 40 (by weight); Sp. gr. of solution at 15 deg. C., 1.50; temperature, not exceeding 25 deg. C.; current density, as high as possible (not less than 200 amp. per sq. ft.); time, approx. 30 secs. after passivity commences. (*b*) *Rinse.*—The article should be removed from the sulphuric-acid solution and rinsed rapidly and thoroughly.

Rapidity of rinsing is especially important with cast iron, as the acid solution readily attacks the metal chemically releasing carbonaceous material. Smut produced in this way or by unsuitable acid cleaning prevents strong adhesion, but any mechanical method of removal such as brushing does not remove it sufficiently to ensure adhesion. The article is therefore rapidly inspected and, if found free from loose smut, is immediately connected to the negative lead and immersed in the nickel-depositing solution. Connection to the negative lead before immersion in the nickel bath may not always be practicable, but is advisable where possible, especially when plating cast iron in low *p*H solutions.

Cast iron cleaned by the recommended method usually has a dark grey appearance, but it should be free from loose "smut." With experience, the presence of smut can be detected visually; a test can be made if desired by wiping with a clean rag or filter paper, but articles so tested should be re-cleaned before deposition. The adhesion which can be obtained by this method is not higher than 8 to 10 tons per sq. in. and is thus much less than the strength of either the deposit or basis metal.

C.E. MOULDING CLAY is marketed by the Kent Chemical Company, Limited, of 27, Elmswood Drive, Bexley, Kent. This is not intended for use in the foundry, but for designers to use in various projects. It is available in four colours, yellow, blue, red, and green.

(*Continued from previous column.*)

MR. HAMMOND said he could never understand why patternmakers did not use a larger angle dovetail and so free moulders from so much carving with a penknife.

MR. SIMPSON said this was a typical case where foresight was exercised by a good craftsman.

MR. SMITH said it was probably a matter of tradition and should be stopped. The dovetail was useless, and it often had to have a clearance to free it from the mould. It ought to be replaced by parallel teeth.

REMARKABLE DEVELOPMENT OF ALUMINIUM

In a recent address to the Design and Industries Association, Dr. E. G. West, of the Wrought Light Alloys Development Association, had a significant message to give concerning the many and important possibilities of light metals in peacetime.

With the recent release of aluminium for purposes other than the manufacture of aircraft, a great opportunity was presented to designers in all branches of industry to make full use of the unique character of aluminium alloys. New knowledge had been gained in such processes as welding, and plant of enormous capacity had been installed to press and form a variety of components for aircraft. There are now, for example, hydraulically operated rubber presses of more than 10,000 tons capacity for the production of sheet-metal components, drop stamps up to nearly 20 tons capacity for forging tough and strong alloys, as well as mechanised foundries and large die-casting machines capable of making hundreds of thousands of components daily.

All these new facilities, combined with a profound increase in knowledge of the properties of light metals must be used in many new fields of post-war application. Motor-buses and coaches, railway coaches, motor-cars and all forms of transport would embody considerable and increasing quantities of aluminium, with a consequent reduction in weight and a saving in fuel as well as an increase of safety.

Anodic Oxidation Process

Many components of both permanent and temporary houses, schools, ships, offices, hotels, restaurants and other buildings would be of aluminium or aluminium alloys—alloys which, in many cases, would be coloured by the anodic oxidation process whereby dyes could be applied to the smooth and polished surface of the metal.

The use of certain aluminium alloys on board ship would reduce weight, thus increasing the stability and safety of the vessel. There was now, in fact, sufficient experience in these and other applications of aluminium to justify every confidence on the part of modern industrial designers in search of a new material.

A PIONEER PASSES

"The Laxtonian," the Oundle School chronicle, contains an obituary notice of Mr. A. Ashworth, who was probably the first engineer ever to be appointed to teach practical workshop practice in a public school. This was in 1896, and so successful were his efforts that for many years Oundle has been popular amongst manufacturers who wished their sons to enter the family business.

Included in the workshops is a small foundry, and it was here that a number of prominent members of the Institute of British Foundrymen received their introduction to the technique of casting metals.

WELDING IN A STEEL FOUNDRY

It is pleasing to learn from a Paper printed in the [American] "Welding Journal" that the repair of steel castings by arc welding is done with official sanction and quite openly. The Paper is by Mr. Frank Kiper and Mr. Lawrence Gabes, and carries the title "Arc Welding in a Steel Foundry." On all alloy steel castings and those carbon steel castings having 0.35 per cent. carbon as a minimum are preheated to 260 deg. C. and are welded before they have reached 150 deg. C. Even before this they have had a preliminary normalise or anneal, whilst later they are again heat-treated. Where possible, the castings are rough machined before welding. One line of castings—medium manganese-molybdenum field-gun breech rings—is manufactured on a conveyorised plant. Defects are removed by dipping and grinding whilst on the conveyor during inspection. They are then "Magnafluxed" and taken to a preheat chamber. This is 36 in. by 36 in. by 20 ft. long and is built on the conveyor line. Whilst still hot they are pushed into the welding booth, serviced by a 1-ton electric hoist. This enables all welding to be done on the flat. Speed is important for, if the temperature goes below 150 deg. C., the inspector returns them to the preheating chamber.

After welding the castings are cooled in still air, the welds are fettled, and despatched to the heat-treatment department. The heat-treated castings are again "Magnafluxed." Metal for the breech-ring layout is melted in a 15-ton electric furnace and for the proper production a line of 12 welders is maintained.

CORRESPONDENCE

(We accept no responsibility for the statements made or the opinions expressed by our correspondents.)

WHEEL MOULDING MACHINE CHARTS

To the Editor of THE FOUNDRY TRADE JOURNAL.

SIR,—Could any of your readers be so kind as to lend the writer, for copying and return, charts of Whittaker wheel moulding machine of the following characteristics?:—Teeth, 10; handle shaft, 120; worm shaft, 60; turn, 12; and the C.L. Scott wheel moulding machine (teeth, 20; handle shaft, 90; worm shaft, 40; turn, 4).—Yours, etc.,

A. E. PERRY.

Stothert & Pitt, Limited,
Bath.
February 9, 1945.

VACATION WORK SCHEME

A short time ago we had occasion to refer to the scheme organised by the Imperial College of Science and Technology for vacation work for its students. We now have before us the Proceedings of a Conference of the Industrial Representatives which was held last December. No fewer than 184 representatives attended, together with 129 of the staff and senior students.

INSTITUTION OF METALLURGISTS

NEW PROFESSIONAL BODY TO BE FORMED

The formation of a professional body representative of metallurgists in all branches has been under discussion for some time. It is now announced that an "Institution of Metallurgists" is to be formed.

A preliminary announcement signed by the members of the first Council of the new Institution states that it will be registered as a company limited by guarantee. The memorandum and articles of association have been drawn up and will be published as soon as they have been approved by the Board of Trade. Applications for membership will then be invited. Membership of the Institution will be confined to those who provide satisfactory evidence of professional competence, for which a high standard will be set. When necessary, candidates will be given opportunities of sitting for examinations, but adequate experience in one or more branches of metallurgy will be essential.

One of the objects included in the memorandum of association reads:—"To promote in every possible way the interests, and to maintain and increase the status and prestige of metallurgists and to encourage scientists whose main interests lie in metallurgy to become and to designate themselves 'metallurgists.'"

Power is also taken to advance the study of metallurgy, to promote the better education of metallurgists, to maintain a register of qualified members, "to adopt any lawful means conducive to the setting-up and maintenance of a high standard of professional conduct amongst metallurgists" and to collaborate with existing professional and scientific institutions, including especially the Iron and Steel Institute and the Institute of Metals.

The Iron and Steel Institute and the Institute of Metals have given assistance in forming the new body. Their Councils addressed the initial invitation to take the legal steps necessary to form the Institution to eleven metallurgists, who, acting on a suggestion made in this invitation, co-opted others; in doing so they aimed at ensuring that the Institution's first Council should be representative of as many interests and districts as possible.

The two Institutes have agreed to give secretarial assistance and to provide accommodation. This offer has been gratefully accepted, but no long-term arrangement has been made. It is hoped that the new Institution will be financially independent from the beginning.

The first Council of the Institution of Metallurgists, under the articles of association, are due to retire at the annual meeting in 1946. Future Councils will be elected by the members themselves, and it will be for such Councils to ascertain and carry out the wishes of the body of members in regard to conditions of membership, subscriptions and all activities of the new Institution.

The first Council are:—Messrs. W. E. Alkins, J. H. Andrews, G. Wesley Austin, G. L. Bailey, W. Barr, W. F. Brazener, H. H. Burton, E. W. Colbeck, Maurice

(*Continued at foot of next column.*)

OBITUARY

COL. W. G. NEWEY, D.S.O., was killed in the accident which befell the aircraft carrying members of the Prime Minister's Mission. He was a director of Newey Bros., Limited, and was on the board of Newey & Tayler, Limited, and D. F. Tayler & Company, Limited, metal rollers and wire drawers, all of Birmingham. Col. Newey was a Territorial major in the Royal Artillery before the war. He was recently employed in Whitehall.

MR. ALBERT JAMES KOOP, formerly keeper of the department of metalwork in the Victoria and Albert Museum, South Kensington, died in London on February 8. Born in 1877, he entered the Victoria and Albert Museum as an assistant in 1900. There he eventually became responsible for forming the important collection of Japanese metalwork, and in 1926 he was appointed keeper of the department of metalwork. He retired in 1937.

MR. H. HERMAN CHILTON died on February 11, aged 82. In 1899 Mr. Chilton joined Mr. J. Legge in forming the company of Chilton & Legge to manufacture lock furniture. In 1916 the firm was merged into J. Legge & Company, Limited, of Willenhall, of which Mr. Chilton was a director and secretary, positions he held up to the time of his death. He found time to do a great deal of literary work and wrote many plays, poems and novels. His play "Grit" was produced at the Kingsway Theatre, London, in 1908.

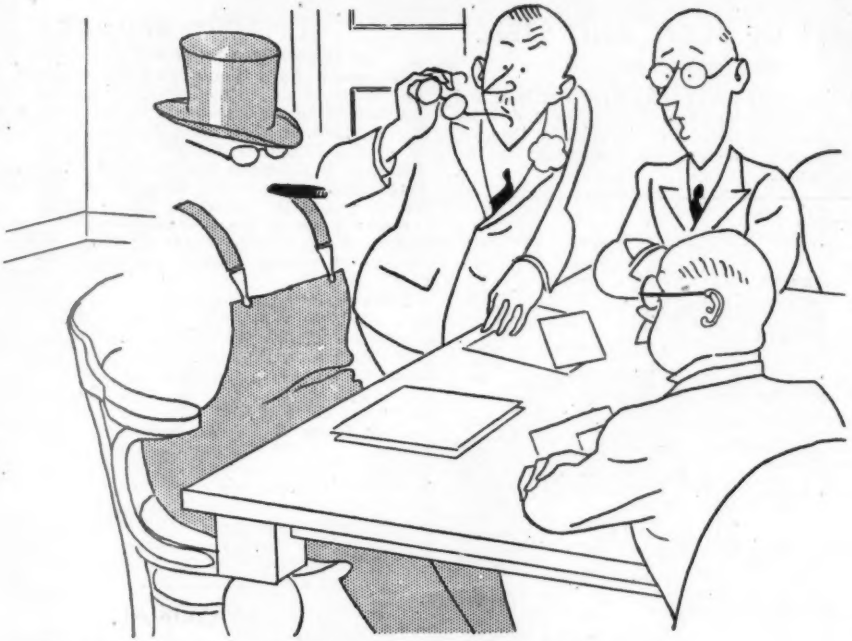
THE "NICKEL BULLETIN" for January contains abstracts dealing with segregation in castings, properties of nickel bronze, influence of phosphorus on nickel-molybdenum cast irons, centrifugal casting of steel, resistance welding practice and surface films on stainless steel. Copies may be obtained, free of charge, from the Mond Nickel Company, Limited, Grosvenor House, Park Lane, London, W.1.

BARKERS (CONTRACTORS), LIMITED, of 25, Denmark Street, London, W.C.2, have sent us a brochure carrying the caption "Survey of Nutrition at Industrial Canteens." It gives in tabular form analyses of the food values taken over a year in a number of canteens operated by them. We fail to appreciate just what ends are sought by broadcasting routine analyses of dishes. The Tables, which include North Wales and Liverpool, do not check up with the survey, which is said to cover the South of England.

(*Continued from previous column.*)

Cook, W. J. Dawson, E. Gregory, Roosevelt Griffiths, W. T. Griffiths, R. A. Hacking, J. L. Haughton, J. E. Hurst, J. W. Jenkin, J. Sinclair Kerr, R. Mather, H. Moore, A. J. Murphy, H. O'Neill, R. Seligman, C. J. Smithells, H. Sutton, and F. C. Thompson.

The address of the Institution meantime is 4, Grosvenor Gardens, London, S.W.1.



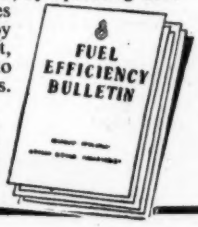
Don't we know, sir, who our Chief Fuel Watcher is?

Of course you know the answer to that in your own place, but how much more could you tell the Ministry about your system for ensuring the utmost fuel efficiency? Only the constant personal vigilance of directors and managers can keep it fully keyed up anywhere. What *have* you to show for it all—anything that will bear comparison with the following?

IN ONE FLOUR MILL they used to keep a grinder running the whole time, whether there was enough material to keep it working at full capacity or not. Now they accumulate the stocks in bins until they have enough for a full load. By this intermittent working, the electricity consumption of this motor has been halved.

AT A WIRELESS STATION savings of 8 per cent. were made in lighting and 14 per cent. in electric heating and power, together with substantial reductions in coke consumption. These results were obtained through the co-operation of factory personnel in switching off unnecessary apparatus, through more careful stoking, and by a greater watchfulness in the matter of room temperatures.

BY NOT LIGHTING FOUNDRY FIRES in the morning and doing all pouring in the afternoon, by operating heat treatment furnaces in batches instead of continuously, and by regular removal of blackout, iron foundries have saved up to 25 per cent. of their coal and gas.



HOW THESE BULLETINS CAN HELP YOU The latest specialized knowledge on almost every conceivable fuel subject is at your finger-tips in the Fuel Efficiency Bulletins—advice and help that ordinarily would have to be heavily fee'd. If you've mislaid your copies, apply now to the Regional office of the Ministry.

Issued by the Ministry of Fuel and Power

EXPORTS OF IRON AND STEEL

FALL SINCE 1913

The following table shows U.K. exports of iron and steel by product for the years 1913, 1934 and 1938. The figures were circulated by Sir Andrew Duncan, Minister of Supply, in reply to a question in the House of Commons.

Product.	1913.	1934.	1938.
	Tons	Tons	Tons
Pig-iron, forge and foundry ...	700,881	74,533	44,375
Pig-iron, acid	242,117	47,910	25,690
Pig-iron, basic	2,264	842	23,947
Ferro-alloys	178,919	9,909	6,787
Iron and steel ingots, blooms, billets and slabs	4,478	12,725	9,706
Iron bars and rods ...	141,452	8,248	3,197
Iron angles, shapes and sections		1,305	486
Steel bars and rods (other than special steel)—			
Sheet bars, tinplate bars		19,633	22,162
Wire rods and bright steel bars			
Rods (other than wire rods)			31
Flats, 5" wide and under			15,968
Flats, over 5" wide ...		122,926	6,604
Other (including rounds, squares and hexagons)—	251,059		
Under 3"			68,914
3" and over			10,598
Steel angles, shapes and sections			
Channels—3" web and under			3,910
Channels—over 3" web		50,354	15,770
Other			47,273
Girders, beams, joists and pillars—			
Not fabricated—			
3" web and under ...		21,275	2,863
Over 3" web	121,870		26,762
Fabricated ...		4,099	3,900
Hoops, baling and barrel ...		44,005	29,346
Hoop and strip for tubes ...		1,337	616
Bright cold rolled strip ...	45,708	1,994	2,895
Other strip		‡	4,551
Steel plates and sheets ¼" thick and over—			
Universal plates ...			669
¼" and under 3/16" ...	136,380	164,462	11,944
3/16" and over			118,439
Steel black plates under ¼" thick ...	71,775	39,025	14,530
Steel black sheets under ⅛" thick ...	68,152	140,520	63,516
Galvanised sheets	762,075	248,836	147,332
Tinned plates and terne plates and sheets		377,995	323,728
Tinned sheets, tinned plates, sheets, etc. for boxes and other containers	494,497	9,777	5,784
Tubes, pipes and fittings—			
Cast	235,052	97,953	91,931
Wrought	164,556	240,789	220,011
Steel rails (new) railway	500,117	113,255	97,819
Steel rails, grooved for trams ...	6,468	3,408	3,123
Sleepers, fishplates and soleplates	118,764*	17,248	25,618
Railway wheels and axles (complete)	42,860	6,367	15,043
Railway tyres and axles	30,041	19,396	29,269
Castings and forgings in the rough or machined	7,601†	5,663	1,626
Wire	60,532	48,655	55,314
Wire manufactures	55,739	27,240	29,508
Other manufactures	525,868	268,492	330,526
	4,969,225	2,250,176	1,961,951

* Excludes soleplates.

† Excludes castings and forgings machined.

‡ Not separately shown.

COMPANY RESULTS

(Figures for previous year in brackets.)

Hammond Lane Foundry—Final dividend of 7% and bonus of 2½%, making 12½% (same).

Industrial Plant—Net profit for the year to November 30, 1944, £342 (£534); dividend of 5% (same); to reserve, £250 (nil); forward, £590 (£782).

Burnell & Company—Dividend of 15% (same) for 1944 and a participating dividend on the 7½% preference shares of 1.568d. per share (same).

Foster Yates & Thom—Profit for the year to September 30 last, £57,003 (£84,025); dividend of 5% (same); to general reserve, £4,000 (same); forward, £1,925 (£1,827).

Delta Metal—Trading profit for 1944, after E.P.T., etc., £244,283 (£241,448); dividend from subsidiary companies, £8,500 (£9,750); to depreciation, £34,077 (£47,180); directors' remuneration, £5,645 (£6,817); provision for income-tax, £140,000 (£123,000); dividend of 12½% and bonus of 7½%, both tax free (same); forward, £30,796 (£28,710).

Clyde Crane & Booth—Net trading profit, before taxation, £79,378 (£104,273); provision for tax, £52,643 (£75,785); directors' fees, £1,316 (£1,278); preference dividend and cost of redemption of shares, £6,260 (£6,285); ordinary dividend of 15% (same), £13,500; written off patents, nil (£1,733); to taxation reserve, £2,000 (same); to general reserve, £3,000 (£4,00); forward, £11,762 (£11,053).

PERSONAL

MR. ISAAC WILLIAMS, chief engineer to the South Durham Steel & Iron Company, Limited, and the Cargo Fleet Iron Company, Limited, has resigned through ill-health after 43 years' service.

CAPT. TOM SHANKS, the senior vice-president of the Scottish Branch of the Institute of British Foundrymen, who has been a prisoner of war in Germany since Dunkirk, has written to Mr. John Bell, the hon. secretary of the Branch, sending New Year greetings to his fellow members.

MR. WILLIAM HENRY WILKINSON has completed 60 years' service with Daniel Doncaster & Sons, Limited, steelmakers, of Sheffield. He has been a director of the firm for over 20 years. Mr. Wilkinson, who is 79 years of age, enjoys good health and takes an active part in the business. Last week the firm presented him with a radiogram to mark his 60 years' service.

MR. H. H. SHEPHERD, F.R.S.A., chief metallurgist and foundry consultant, also honorary A.R.P. (P.A.D.) officer to Crane, Limited, Ipswich, with whom he has been associated for more than 18 years, has resigned from the company's service in order to take over the appointment of chief metallurgist and technical assistant to the ironfoundry departments of Sterling Metals, Limited, Coventry.

Wills

SCARP, FREDERICK, of Edgbaston, chairman and managing director of A. Knowles, Limited, iron and steel stockholders, and the Bromford Iron Company, Limited £604,992

WM CUMMING & CO., LTD.

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The "CUMMING" PATENTED CRUCIBLE FURNACE

OIL-SAND MIXERS

ELECTRIC RIDDLES

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PARTING POWDERS XPP AND OTHER NON-SILICA GRADES

"STANDARD" "NEW GRADE"

EX STOCK.

KELVINVALE MILLS, MARYHILL, GLASGOW, N.W. AND BRANCHES AT FALKIRK, CHESTERFIELD, DEEPFIELDS AND MIDDLESBROUGH

NEWS IN BRIEF

AN ASSURANCE that he would not continue industrial conscription in peacetime has been given to the House of Commons by Mr. Bevin.

THE WORTLEY IRON COMPANY, LIMITED, is being wound up voluntarily. Mr. H. S. Wainwright, 26, Park Row, Leeds, 1, is the liquidator.

RELIANCE STEEL PRODUCTS, LIMITED, is being wound up voluntarily. Mr. L. N. Coombe, Eldon Street House, Eldon Street, London, E.C.2, is the liquidator.

THE STOCK EXCHANGE COMMITTEE have granted permission to deal in the 71,428 "new" £1 ordinary shares of F. H. Lloyd & Company, Limited, steel-founders, of Wednesbury, Staffs.

NOTICE IS GIVEN of the release of the trustee, as from January 20, in connection with the affairs of J. O. H. Willing, 76, Dorset House, Gloucester Place, Baker Street, London, metal merchant.

THE STAVELEY COAL & IRON COMPANY, LIMITED, have offered to acquire the whole of the ordinary shares in Bradley & Foster, Limited, refined-iron makers, chilled shot and grit and heat-treatment specialists, of Wednesbury, Staffs.

THE BOARD OF TRADE have granted permits for the export of substantial consignments of machinery to South America, including an important quantity of grain-milling machinery. Delivery in most cases has been promised for the current year.

THE EXPORT COMMITTEE of the Gauge and Tool Makers' Association is preparing a *questionnaire* concerning conditions in various world markets, which the Department of Overseas Trade has offered to send to all Overseas Trade Officers throughout the world.

IT IS REPORTED from Sweden that the Sandviken ironworks will spend about 5 million kronor on the construction of new plant in order to meet increased post-war demand. The work will include a new cold-rolling mill and enlargement of the electric-steel plant.

IN A CLAIM by the Ironfounding Workers' Assocation that in the case of moulders employed by members of the Greensand Pipe Founders' Association of Scotland the 10 per cent. advance granted on spigot and faucet pipes from April, 1944, should be extended to cover flange pipes, the Industrial Court award that the claim has not been established.

DR. VAN DER BIJL is reported to be contemplating, after the war, the erection of a large engineering works close to the Iscor plant at Pretoria, which itself already possesses the largest machine shops in the Union apart from the railways. The new works will be able to make a wide range of engineering equipment, including blast-furnace and steelworks plant, thus rendering South Africa more independent of outside sources of supply.

THE DIRECTORS of Minerals Separation, Limited, announce that during 1944 the company entered into an agreement with Foundry Services, Limited, of Birmingham, under which it took over the fluxes manufacturing side of that company's business from July 1 last. This has resulted in an unavoidable delay in the preparation of the complete audited accounts for 1944, and it is unlikely that the annual meeting can be held before June, 1945.

EXPORT LICENCES had been granted for two large orders for steel which they had placed in the United States, and this steel should arrive in the late spring and materially increase their output, said Mr. Thomas J. O'Neill, chairman of Springs, Limited, speaking at the annual meeting in Dublin. There had been no improvement in the raw material position during the year, and, apart from some steel supplied by Henry Ford & Son, Limited, for the manufacture of Ford springs, no new steel was forthcoming.

IN THE COURSE of a visit to a number of West of Scotland factories recently, Sir Stafford Cripps, Minister of Aircraft Production, spoke of the transition from war to peacetime industry, and said that every effort would be made to avoid a repetition of the disaster of the last war, when there was great unemployment, in which Scotland suffered severely. The change-over would cause a great deal of difficulty to managements and workers, but the Government was doing its utmost to make this change-over as smooth as possible.

SPEAKING AT THE annual reunion luncheon of the Glasgow University Engineering Society, Sir Harold E. Yarrow said the Clyde, and Glasgow University in particular, could feel very proud of the wartime achievements in marine engineering. There was a very wide field for the engineer. He did not think any young man could hesitate in taking up some form of engineering for the future. Dealing with the importance of research, Sir Harold said that care must be taken to carry on research on lines that were going to be ultimately an economic proposition.

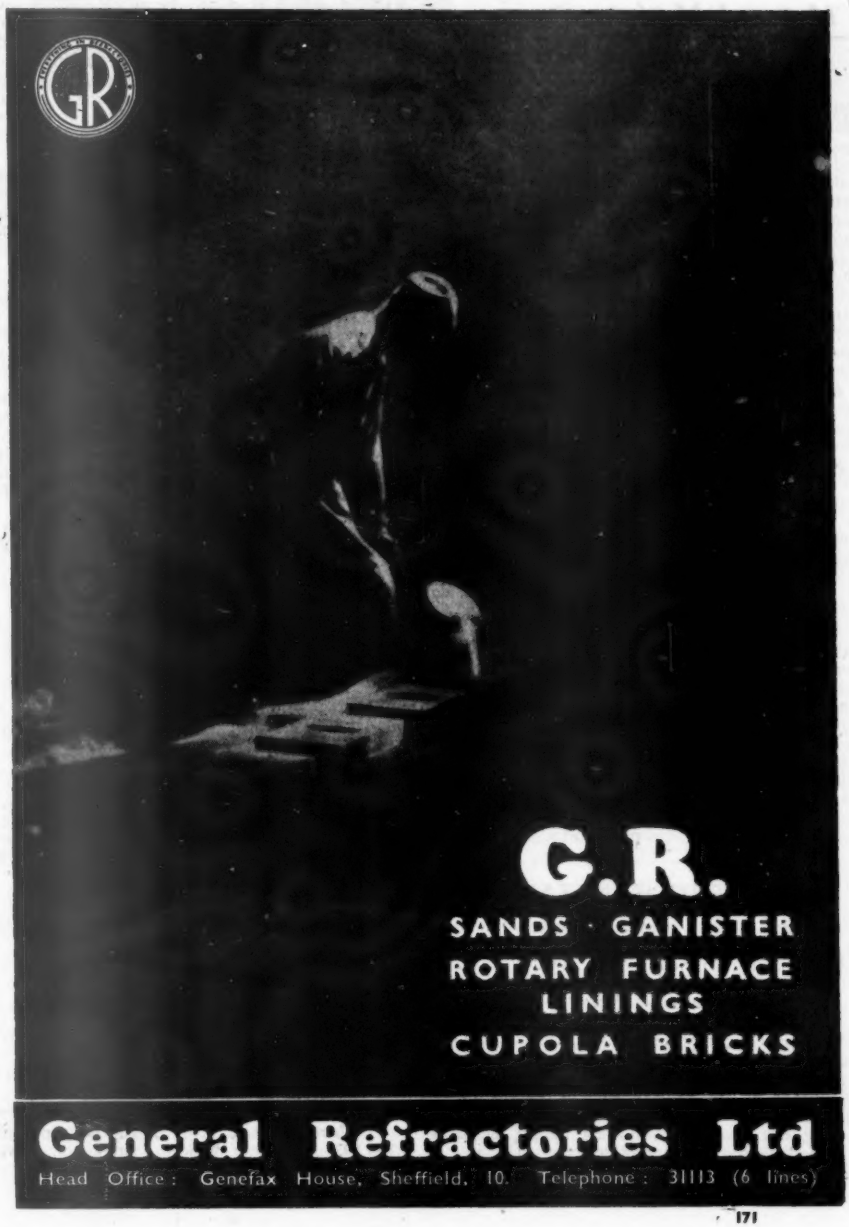
MR. FRANK PARFETT, delivering his second presidential address before the Society of Engineers recently, declared that there was a widespread and growing opinion amongst professional engineers in favour of federation of their institutions in order to have co-ordination of policy and joint representation on matters common to the whole profession. During the past year two committees, whose members came from various institutions, had been concerned with this matter, one of them dealing with national and the other with international federation. Very shortly proposals would be circulated to the councils for their consideration.

CONTRACTS OPEN

Any date given is the latest on which tenders will be accepted. The address is that from which forms of tender may be obtained.

Belfast, March 1—Castings, etc., for the Town Council. Tne Acting General Manager, Transport Department, Sandy Row, Belfast.

Dewsbury, March 5—Iron castings; steel reinforcements, etc., for 12 months from April 1, for the Corporation. Mr. Ernest Shaw, borough engineer, Municipal Buildings, Halifax Road, Dewsbury.


G.R.
SANDS · GANISTER
ROTARY FURNACE
LININGS
CUPOLA BRICKS
General Refractories Ltd
Head Office: Genefax House, Sheffield, 10. Telephone: 31113 (6 lines)

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Raw Material Markets

IRON AND STEEL

Adequate supplies of coke, ironstone and limestone are coming forward to maintain the operative blast furnaces in full production, and outputs are now fully absorbed. The recent improvement in the light-castings trade, limited though it be, has drawn attention to the somewhat slender reserves of high-phosphorus iron at present in hand, and the scarcity of labour and fuel constitutes obvious difficulties in regard to the relighting of additional furnaces. Licences for the purchase of foundry iron are consequently subject to some restriction, and the whole of the output is passing promptly into consumption. The import of Spanish and North African ores is not sufficient to permit of any expansion in the make of hematite, and engineering foundries are still using low- and medium-phosphorus grades as well as refined iron as substitutes for hematite. For ferro-manganese a very brisk demand has developed which at times is somewhat in excess of the supply.

The promptitude with which all available tonnages of defective billets and sheet bars, double-sawn crops, etc., are taken up indicates the heavy strain upon the sources of re-rolling material. Now that imports of American material have to be paid for in cash, this trade has virtually ceased and such stocks as remain in the hands of the Control are being carefully husbanded. Hence there is steady pressure for mild-steel billets, blooms, slabs and sheet bars, with small billets particularly scarce.

Re-rollers have still the assurance of a steady run on light sections, small bars, etc., and the accumulation of orders for light sheets is such that delivery dates three or four months ahead are now being indicated. In the heavy steel trade the brightest features are the sustained demand for rails, fishplates and sleepers for home and colonial railways, and the continued inquiries for colliery maintenance material. In sharp contrast is the apathy in the market for heavy joists and channels and the complete absence of any signs of returning animation at the plate mills.

NON-FERROUS METALS

There appears to have been an upsurge of activity in war production in the United States. Zinc producers have been informed by the War Production Board that their metal will shortly be placed under control once more because of renewed wartime demands. Control of zinc was abandoned last September. An increase of consumption in other metals also is expected in America. There seems to be no comparable expansion in consumption in this country. Probably the needs of the war factories in certain metals are a little higher than they were in the closing months of last year, but they are still well below the peak levels attained earlier in the war period.

The restrictions on the use of metal in the United Kingdom are gradually being relaxed in several directions. The tonnage being used for ordinary civilian purposes is not very large yet, but the gradual lifting of the restrictions is a step in the right direction. It is understood that the copper supply arrangements between the Belgian Congo producers and the United Nations have been renewed for another six months. There is no news yet that discussions have been resumed with the Empire producers.

Rumours persist that the price of aluminium is to be reduced, but no official pronouncement is forthcoming as yet. Meantime, light metals, generally, are fairly freely available for non-war purposes.

NEW COMPANIES

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

Shindler Engineering, 59-61, Hatton Garden, London, E.C.—£2,500.

Kite Engineering Company, Thurston Street, Cardiff—£1,000. D. S. Kite and L. Palmer.

Starling Foundries—£2,000. T. W. Perry, 43, St. Georges Road, Petts Wood, Kent, subscriber.

D. H. Parkson, 12, Tudor Way, London, W.3—Engineers, etc. £500. D. O. and H. O. Parrack.

Sid Cubbage (Engineers), Crown Works, Frogmoor, High Wycombe—£5,000. S. W. J. and L. A. Cubbage.

Mansfield Maxon—Engineers, etc. £2,000. A. H. Cornwall, 12, Queens Gardens, Heston, Middlesex, subscriber.

Haw & Holroyd—Engineers, etc. £2,000. G. H. L. Haw, 47, West Park Crescent, Roundhay, Leeds, 8, and F. Holroyd.

Allied Constructional & Mechanical Engineers (London)—£1,000. E. Jamison, 4, North Road, Droylsden, and D. Jamison.

Wemdel, Mossley Buildings, 56, Mossley Street, Manchester, 2—Engineers, etc. £1,000. R. Wemyss, J. D. Delaney, and W. Wrigley.

NEW PATENTS

The following list of Patent Specifications accepted has been taken from the "Official Journal (Patents)." Printed copies of the full Specifications are obtainable from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. *each.*

566,363 GREENWOOD & BATLEY, LIMITED, and MACLAGAN, J. C. M. Heading machines.

566,375 UDY, M. J. Metallurgy.

566,484 SCHAEFER, E. Moulds or dies for the moulding of metallic alloy powders under heat and pressure.

566,538 CLEVELAND GRAPHITE BRONZE COMPANY. Method of cleaning and etching ferrous metal articles.

566,548 DELAWARE ENGINEERING CORPORATION. Furnace roofs.

566,633 DU PONT DE NEMOURS & COMPANY, E. I. Electrodeposition of tin and electroplating baths.

566,592 BIGWOOD & SON, LIMITED, J., TINLEY, E. L., and DRIVER, F. A. Furnaces.